REMARKS

The Official Action has again been carefully reviewed. The review indicates that the claims, as presently amended, recite patentable subject matter and should be allowed. Reconsideration and allowance are therefore respectfully requested.

Prior to contending with the grounds on which the rejections have been made, an overview of the improved integrated metal etch tool structure for removing post-RIE polymer rails from Al/Cu metal lines of a semiconductor structure will be provided to better define the integrated metal etch tool structure and to draw a clearer distinction between the invention structure and those of the cited references.

In the art of making semiconductor structures in which there must be removal of post-RIE polymer rails that are formed on a Al/Cu metal line, applicants have invented an integrated metal etch tool interfaceable with vacuum and deionized water rinse chamber means or strip, vacuum and deionized water rinse chamber means that removes sidewall polymer rails left behind after the metal (Al/Cu) RIE process.

The inventive structure strip, vacuum, and deionized water rinse chamber means interfaced with the metal etch tool performs the chemical reaction functions of:

$$SiO_2 + 6HF + 2\ NH_3 = (NH_4)_2\ SiF_6 + 2H_2O \quad [1]$$

$$Al_2O_3 + 6HF = 2AlF_3 + 3\ H_2O \quad [2]$$

$$HCl + NH_3 = NH_4Cl \quad [3]$$

(either post resist strip or prior to resist strip), to allow the products from both etching and neutralization reaction to be soluble in deionized water.

Note is taken of the manner in which applicants' claims have been construed in regard to the means plus function section of paragraph 6 of 35 USC §112; however, applicants respectfully disagree with this construction as well as the conclusion that claims 13 and 16 fail the three-prong analysis on allegations that applicants have additionally included either further modifications of sufficient structure, material or acts for achieving the specified function.

Firstly, Section 112, paragraph 6, states that a means-plus-function claim (shall be construed to cover the corresponding structure… described in the specification." (emphasis added). In this regard, the Federal Circuit holds that, pursuant to this provision, structure disclosed in the specification is "corresponding" structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim. This duty to link or associate structure to function is the *quid pro quo* for the convenience of employing section 112, Par. 6. *Braun Medical Inc. v. Abbott Laboratories*, 124 F.3d 1419, 43 U.S.P.Q. 2d 1896, 1900 (Fed. Cir. 1997), citing *O.I. Corp. v. Tekmar Co.*, 115 F.3d 1576, 1583, 42 U.S.P.Q.2d 1777, 1782 (Fed. Cir. 1997).

But in any case, the amendment of claims 13 and 16 is such as to dispel any construction of these claim not in compliance with the strictures of 35 USC §112, ¶6.

Claims 13-17 were again rejected as being anticipated by Kawasaki et al. under 35 USC 102(b).

Applicants respectfully traverse the rejection and request reconsideration for the following reasons.

Kawasaki et al. only disclose a method of removing residual corrosive compounds by plasma etching and washing. The apparatus therefor (see col. 3 lines 22-44) essentially comprises eight parts - however, the apparatus lacks a metal etch tool interfaceable with strip chamber means, vacuum chamber means and water rinse chamber means to remove soluble material in deionized water.

Withdrawal of the rejection is respectfully requested.

Claims 13-15 were again rejected as being anticipated by Okutani under 35 U.S.C 102(b).

Applicants respectfully traverse this rejection and request reconsideration for reasons hereinafter set forth.

Okutani disclose a method of and apparatus for producing semiconductor devices. These apparatuses for producing semiconductor devices incorporates a dry processing mechanism and a wet processing mechanism for the wafers, and a carriage mechanism to reduce the space for the apparatus for dry-processing and wet-processing. There is no reference to or mention of, the need for apparatus to remove the products of etching and products from neutralization of the etchings to

prevent the sidewalls from trapping chlorine and water species. Therefore it is hardly surprising that Okutani's apparatus lacks an integrated metal etch tool interfaceable with strip, vacuum and rinse chamber means to remove the etchant reaction products and the neutralization of those etchant products, both of which are soluble, in a deionized water rinse chamber.

Withdrawal of the rejection is respectfully requested.

Claims 16 and 17 were again rejected as being anticipated by Chen et al. under 35 U.S.C. 102(b).

Applicants respectfully traverse this rejection and request reconsideration for reasons hereinafter set forth.

Chen et al. only disclose a vacuum chamber for passivating and stripping to inhibit corrosion of a semiconductor substrate, wherein the chamber strips the polymeric remnant resist remaining on the substrate. Mere conventional processing equipment is used (see col. 3, lines 17-19) to passivate and strip the substrate. In fact, FIG. 2 of Chen et al. is revealing as the most comprehensive depiction of its vacuum chamber arrangement. Notably absent from this figure is any reference to or mention of, an integrated metal etch tool interfaceable with vacuum chamber means and strip chamber means, as those now recited in applicants' claims as amended.

Withdrawal of the rejection is respectfully requested.

Claims 16 and 17 were again rejected as being anticipated by Davis et al. under 35 U.S.C. 102(b).

Applicants respectfully traverse this rejection and request reconsideration for the reasons which follow.

Davis et al. disclose apparatus for transferring work pieces such as integrating circuits. The apparatus comprises:

(a) a vacuum carrier having a sealable carrier door and capable of maintaining a vacuum with the workpieces therein, the carrier door movable between an open and close position;

(b) a chamber adapted to receive the carrier and selective move and carrier door and having a closeable port; the chamber capable of maintaining an applied vacuum;

(c) a moveable arm located within the chamber and capable of engaging the workpieces, the arm moveable into the carrier and through the port to transfer the workpieces;

(d) a transfer mechanism located exterior to the chamber and adapted to transfer the workpieces from the arm to a non-vacuum processing station; and

(e) a control system selectively applying vacuum and ambient pressure to the chamber.

While Davis et al. disclose a multi-chamber apparatus, this apparatus clearly lacks chamber means to perform semiconductor structure chemistry (removal of etchant and neutralization products) to permit a final rinse step using only deionized water.

In point of fact, Davis et al. clearly lacks the apparatus combination of either the vacuum and rinse chamber means interfaceable with a metal etch tool as required in claims 16-17.

As such, Davis et al. fails to anticipate applicants' claims as presently amended.

Withdrawal of the rejection is respectfully requested.

The notes regarding claim interpretation, which is a matter of law for a district court or the CAFC, are misplaced, as it is error to regard the functions of apparatus as a method limitation, inasmuch as the 6th paragraph of 35 U.S.C. §112 clearly permits means plus function language to be includable in a claim as a necessary and indispensable condition to satisfy the "means plus function" requirements.

This necessity is clearly shown in applicants' specification on page 8, lines 21-24 where it is stated that, if the etchant and neutralization reactions do not occur in the vacuum chamber, the sidewall can trap chlorine and water species - thereby resulting in a corrosion cycle where the chlorine acts as a catalyst. In that case, reactions 4 and 5 (as shown on page 8, lines 25-28 will occur). The novel arrangement of applicants' integrated metal etch tool interfaceable with the vacuum and strip chambers in claims 16 and 17 do not permit the small time window between metal RIE and the sidewall removal which would allow corrosion to transpire. Further, the low reaction pressure (under 10 m Torr) enables the H_2O reaction product to escape. And, the low

reaction pressure also enables easy integration of the chamber designed to carry out reactions 1-3 with the metal RIE process tool.

As stated in applicants' specification on page 9, the vacuum chamber may be interfaced with the metal etch tool or left as a stand-alone chamber for introducing the reaction mixture; however, applicants have recited the most effective arrangement, which is the vacuum chamber interfaced with the metal etch tool.

Davis et al. clearly lacks any reference to or mention of such an arrangement.

Note is taken of the objections raised to claims 13 and 16; however, in view of the amendments made deleting "I", these objections are no longer applicable.

In view of the foregoing amendments, remarks and arguments, it is believed that the application is now in condition for allowance and early notification of the same is earnestly solicited.

Respectfully submitted,

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